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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,980	07/03/2003	Masahiro Yamagata	239785US3	4166

22850 7590 06/01/2007

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EXAMINER	
SIEFKE, SAMUEL P	
ART UNIT	**PAPER NUMBER**
1743	

NOTIFICATION DATE	DELIVERY MODE
06/01/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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oblonpat@oblon.com
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Office Action Summary	Application No.	Applicant(s)	
	10/611,980	YAMAGATA, MASAHIRO	
	Examiner	Art Unit	
	Samuel P. Siefke	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 and 7 is/are rejected.

7)☒ Claim(s) 2-6 and 8-9 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 7/3/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Costantini WO 01/78911 A1 (herein after Costantini) in view of Lee (USPN 3,420,633).

Costantini teaches a supercritical fluid delivery and recovery system for semiconductor wafer processing. The method comprises bring a high pressure fluid (carbon dioxide, page 9, lines 11-20; page 19, lines 21-25) into contact with a processing object (semiconductor) in a high pressure processing vessel (fig. 1, ref. 37; page 10, lines 6-17) where the high pressure fluid performs the intended process function such as cleaning or stripping. The high pressure fluid accompanied with unnecessary materials is passed into a recovery section and is now called the effluent (page 11, lines 8-14). The effluent passes into separator 56 where the pressure and temperature is lowered to the below the critical pressure and temperature of the effluent. The Examiner is interpreting this step as the decompressing step of claim 1 where the waste high pressure fluid is decompressed and turns into the waste medium pressure fluid. Under the reduced pressure and lower temperature described above, the effluent separates into a vapor phase and a liquid phase (waste medium pressure fluid). The vapor phase contains the gas or gas mixture originally supplied by feed pump 23 and a small fraction of co-solvent or dissolved liquid or solid from the wafer in press chamber 37. The gas then combines with the gas supplied by tank 1 and passes through a filter 10 (refining). The liquid phase (waste medium pressure fluid) passes into separator 61 to provide for separation into a vapor phase containing the co-solvent and a liquid phase containing any remaining contamination (page 12, lines 1-14). This liquid phase is now in a waste fluid state and is discharged through isolation valves 64

and 63 to holding tank 65 (page 12, lines 9-19). The tank 65 is then removed for disposal by closing the isolation valves 63 and 64 and disconnecting the line between them (removing from the system).

Costantini does not teach employing a packing material in the separator 61 and an adsorbent for refining the gas (carbon dioxide). Costantini does teach passing the gas from tank 1 which includes the vapor phase from the separator 56 through a filter for removing impurities, solute, solvent, water or other contamination, dirt or particles to a predetermined level necessary for correct process performance.

Lee teaches a system for removal of impurities from a gas that comprises a separator that employs a packing material such as packing beads in the shapes of spheres, rings, saddles or other shapes (col. 6, lines 9-20). Lee passes a stream 43 into a separator above a packed section 45 where the liquid phase of stream 43 flows downwards through section 45 in extended surface contact with a rising hot vapor phase, which is generated by heating the collected liquid phase in the lower part of unit 44. This extended surface contact provided by the packing material allows for a better liquid-vapor contact which increase the stripping ability of the vapor phase passing up through the separator. Therefore it would have been obvious to one having an ordinary skill in the art to modify Costantini to employ a packing material in the separator to allow for better recovery and higher purity of the co-solvent to be recovered and reused in the process.

Regarding the adsorbent employed for refining the gas ingredients, Constantini states that the gas removed from the separator 56 contains a small fraction of co-

solvent or dissolved liquid or solid from the wafer in the process chamber. Lee teaches removing the gaseous phase separated by a liquid-gas separator 31 (like separator 56 of Costantini), which contains the gas of interest, and further passing the gas through a suitable purification unit 33 which contains a bed of activated carbon (adsorbent). This purification unit adsorbs the contaminants in the gas of interest. Therefore, it would have been obvious to one having an ordinary skill in the art to modify Constantini to pass the gaseous phase through a bed of activated carbon to further purify the gas so that impurities will not be reintroduced into the system for cleaning a processing object.

Allowable Subject Matter

Claims 2-6, and 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claim 2, the prior art does not teach or fairly suggest an additional step of providing a passing the waste medium pressure fluid to a reservoir tank that is located upstream of the separating means. Claim 3 is dependent on claim 2. Regarding claim 4, the prior art does not teach or fairly suggest an additional step of separating the waste medium pressure fluid into a gas and a liquid before entering the separating means. Regarding claim 5, the prior art does not teach or fairly suggest an additional step of recirculating the liquid ingredients, obtained from liquefying the gas ingredients from the absorbing means, back into the separating means after being pressurized. Regarding claim 6, the prior art does not teach or fairly suggest decompressing the waste high pressure fluid wherein

the waste high pressure fluid being 1Mpa or more but less than the critical pressure of the waste pressure fluid. Regarding claim 8, the prior art does not teach or fairly suggest the pressure of the waste high fluid being 7.4 Mpa or more and the waste medium pressure fluid being 3 Mpa or more but less than 7.4Mpa. Regarding claim 9, the prior art does not teach or fairly suggest the packing material having a specific surface area per unit volume of 200 – 500 m^2/m^3.

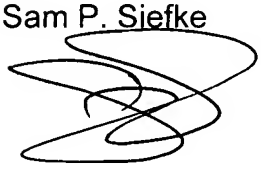
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel P. Siefke whose telephone number is 571-272-1262. The examiner can normally be reached on M-F 7:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1700. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sam P. Siefke



May 24, 2007